

Can Reforms be Made Sustainable?
Analysis and Design Considerations for
the Electricity Sector

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Foreword

Electricity reforms unfold as a redistribution of property rights under a new set of rules. These rules may or may not be consistent with the cultural beliefs of the country, its human capital endowment to implement and guide the reform process, the backing of the judiciary and other organizations to enforce the regulatory contract, and the active defense of welfare gains by the coalitions of reform supporters. A reform is a deeply political process in real time, with plenty of surprises and prone to mistakes and backlashes, as the “losers” may be long-lived and will keep continuous pressure to recover the rents or benefits they enjoyed under the previous regime.

This study starts by presenting a collection of archetypical problems that became apparent during the initial period of electricity reforms, stressing the incompleteness of the default approach to reform (change in ownership and incentive regulation). A broader context to examine and design sustainable reforms is needed. The study presents a summary discussion of three new conceptual frameworks that are useful to analyze and design microeconomic reforms: the transaction-cost politics approach, the new institutional economics and the new political economy. The transaction-cost approach puts forward the idea that an instantaneous switch to a first-best world is a chimera. A trade-off between the political feasibility of the reform and the elimination of rents is likely to exist. Multiple interests will put the new order under contradictory pressures, thus reducing the scope of the original goals or altering their intended direction. Regulation encompasses much more than the rules of the game—which can be skewed, skipped or modified—and the regulatory office itself. The new institutional economics characterizes institutions as *crystallized beliefs*. It stresses the support of customers and the role of complementary institutions (the judiciary, the antitrust bodies, etc.) as the two ultimate pillars of reform sustainability. Finally, the new political economy stresses the need of permanently assessing the net balance of political support at each instant of time so as to calibrate the depth of reform changes and its sequence.

The report concludes with a list of themes that should be considered when designing electricity reforms. The author explicitly warns about the incompleteness of the proposal. This is an attempt to turn powerful economic ideas that are still in the making, into aids for project design. Further debate, reflection and experimentation should be pursued to further enhance these tools.

Pietro Masci
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Introduction

The evolution of reforms in the electricity sector is a fascinating topic needing permanent surveillance and policy review. This document discusses and proposes a new framework to improve the quality of programs supporting such reforms in Latin America. A combination of three circumstances provided the genesis for this paper. Firstly, it responds to the risk that the reforms in the region might be reversed, which might originate in the lack of public support for privatization and the succession of crises and events in the recent past (problems of supply in Chile and Brazil; price peaks in the spot market in El Salvador; the commercial unsustainability of the pool in Colombia; the ENRON/Andersen scandal, and the Argentine crisis among others), that have provided the enemies of reform with new political space.¹

Secondly, it responds to evidence that the consolidation of sector reforms is not automatic, involving as it does the simultaneous creation of traditions of respect for the rights of investors and consumers. Consolidation hinges less on formal changes than on the existence of an effective system of social checks and balances. At the same time, it involves the mobilization of those interests that favor reform. Consequently, those in charge of implementing reforms should understand the

links between reform performance and the political management of the process.

Finally, this paper partly builds upon the experience gathered from a project supporting the sustainability of electricity reform in three countries (Colombia, Guatemala and Honduras), conducted by the Sustainable Development Department of the IDB in 2001 and 2002. These three case studies provide many examples of the ideas advanced here, thus facilitating the use of a conceptual style.

In this companion piece, the author is telling the interested reader things he (she) may find familiar, with a bonus: a framework for reform design, incomplete yet ready for enrichment by further experience and debate. The next section of this report justifies the need to widen the conceptual framework in the design of electricity sector reforms, based on a classification of major institutional and political economy problems of electricity reforms observed so far. The third section gathers together some of the new contributions from economic theory relevant to the study of institutional change. The last section presents a conceptual framework for designing and supporting reforms.

¹ Similar concerns are to be found in Lora and Panizza, 2002.

Limitations of Reforms Reduced to the Change of Initial Conditions

In a nutshell, the recommendations to carry out microeconomic reforms worldwide during the nineties consisted of redistributing property rights (to remove politics from the management of traditionally public firms) and formulating new ground rules (introduction of competition and incentives). This process resulted in the following:

- Achievement of financial viability because the agents were responsible for profits and losses.²
- Competition (especially in short-term generation markets) would produce efficient generation prices and reduce market power.
- The regulation of prices in natural monopolies would bring a reduction in transmission and distribution costs.

If such conditions were met, private investors would be adequately remunerated, consumers would not pay excessive rents, and shifts in energy generation prices would stimulate investment in new plants.

The reforms instituted (which, of course, varied according to the country in question) covered areas such as regulation of the sector; changes in the ownership of firms (privatization); ending vertical integration; promoting competition and free entry in generation; setting prices through spot market competition; and regulating prices in transmission and distribution bottlenecks.

These recommendations stemmed from two important advances in economics that took place in the 1980s; namely, research on the impact of the structure of property rights on the decisions and behavior of firms, and the theory of incentive-based mechanism design. Ideally, privatization would bring an end to political control over firms, yielding reductions in costs and efficient prices.

² It should not be forgotten that the practical reason behind the reform of public services in Latin America was the lack of financial viability of most publicly-owned companies in the region.

These theories are by no means erroneous, but their impact depends on each country's specific context, particularly on the inertial effects of customary ways of doing things and the persistence of political interests. A partial listing of the types of problems that arose during the implementation of reforms appears below.

Initial changes tend to be erratic. Reformers do not possess unlimited powers or capabilities, but they may certainly have their own agenda. Defining the new rules of the game comes about in the midst of negotiations between different interest groups. All reform laws tend to involve compromises and distortions imposed by coalitions with veto powers. The reformer—or more exactly, the consultants involved—can propose measures that can have results contrary to those desired. An example is the performance of bid-based pools in which the predicted price competition never materialized.³ Another is the mechanism for setting final consumer prices in the Californian market, which impeded the pass-through of generation prices (and led to the bankruptcy of distributors in 2000 when prices rose out of a combination of scarcity and market power in generation).

The new rules can be ignored, manipulated or changed. Even in the hypothetical case of formal changes that are wholly in line with the expectations of reformers, real world implementation depends on the regulator's capabilities;⁴ the pos-

³ Price competition in a pool is difficult when there are different technologies (thermal generation versus hydroelectric), *must-run* plants (those needing to generate continuously), and transmission network constraints. At a deeper level, price competition may not occur at all when incumbents make strategic use of long-term contracts.

⁴ Lack of human capital means that new regulators will have lower average skills than their predecessors, which reduces the capacity and autonomy of the institution. The problem is made worse if there is a high turnover of regulators (so that firms have a bet-

sibility of verifying outlawed practices;⁵ the support of the judiciary and anti-trust institutions (where these exist);⁶ and basic societal beliefs about what should happen to those who break the rules.⁷ In sum, the legitimacy of and compliance with norms are endogenous.

Ex ante competition is insufficient to eliminate rents. Political cycles tend to change the return on investments. Privatization tenders, even when there is no manipulation, can be used to buy the option to renegotiate more favorable conditions *ex post* in countries with a weak judiciary (especially when the criterion for divestment is to gain the maximum income for the state entity; Dixit, 1999).⁸

The incentives proposed by the regulator may not be credible. The theory of contracts that may encourage firms to reveal truthful information or to increase efficiency, implicitly assumes that just a single strategic interaction exists between the regulator (*principal*) and firms (*agents*). In practice, the power of incentives is diminished by, among other things, the repetition of interactions between principal and agents, regulatory risk and the appearance of lasting coalitions among agents. Regulated firms understand that rents arising from asymmetric information can disappear even be-

ter understanding of the norms than the regulators themselves).

⁵ There is an abundant literature on strategic behavior in the British market when it was dominated by two large generators, with the regulator –(despite its technical capacity and the coherence between its objectives and those of the competition control authority) remitting no more than a handful of cases for investigation.

⁶ In Colombia, for example, the courts view with hostility the idea of regulation as delegation.

⁷ If the public has little trust in the courts because they are seen to defend powerful interests, opportunistic firms will win the concessions for privatization. Beliefs thus become self-fulfilling prophecies. Benavides and Fainboim (2002) discuss the relationship between beliefs and enforcement in highway concessions in Colombia.

⁸ Influential firms have been observed to use their advantages to gain bids for tenders and then to push for a change in remuneration once the contract is settled. This is more common among firms *de novo* in situations where property rights are poorly delineated and where there is corruption (Hellman, Jones and Kaufmann, 2000).

fore the second tariff revision (in the case of distributors), once they accept to reveal truthful information. In addition, political considerations may lead the regulator to modify the price caps to the final consumer before the tariff revision. This reduces the incentive to introduce better technologies to reduce costs, as was the case in the British market when OFFER was still in existence. When regulation is highly detailed and complex and when uncertainty over short-term prices is high, agents have incentives to coordinate how they behave toward the regulator. In such cases, policies intended to encourage competitive efforts lose their effectiveness.⁹

The social context reduces the range of viable regulatory instruments. In the case of electricity, the threat of government intervention to cap prices means that investors in generation anticipate that the right to receive quasi-rents during times of excess demand does not apply. This will lead them to ask for additional payments (capacity payments fulfill this role) to complement their income. Entry of new plants could be a very opaque process when public tenders have multiple purposes (“beauty contests”) or when competition is bypassed and discretionary decisions are justified on the basis of having to deal with economic or sector crises. Due to the politicization of the service, distribution firms may fail to honor payments for wholesale energy (as they cannot easily disconnect their clients in arrears). Financial viability is not automatic, even in the case of private firms.

This sample of problems illustrates the tension that exists between what is desirable and what is practicable in electricity regulation. The complexity of regulation makes it necessary to design programs that give greater weight to supporting the process *once it is under way*.

⁹ For example, bidding into the pool and contracting strategies tend to “bunch” by generating technology type.

Economic Theory Developments Useful for the Design of Reforms

THE TRANSACTION COST POLITICS APPROACH

In proposing the analytical framework of transaction cost politics, Dixit (1996) argues that the scope and presence of transaction costs are more marked in political relations than economic ones, since political agreements cannot be made contractually enforceable. In the best of cases, non-compliance of a political promise in a democratic society can be punished by means of the less-than-perfect tool of the ballot box.

The design of economic policies is characterized by the presence of asymmetric information and limited possibilities of commitment, this being precisely the nexus in which the regulation of public services takes place. The central conclusions of Dixit (1996) are so simple as to seem trivial: the political process is a real-time game in conditions that are uncertain and changing, with many participants (principals) trying to influence the actions of the policy designer (agent). It is a process that is constrained by history, social habits and the collective memory, as well as being full of surprises for everyone. The resulting equilibrium in the game of policy design typically does not maximize anything. Attempts to identify a “truly optimal” policy are destined to fail, since no great results should be expected from any particular organizational form.

The changes that are feasible may therefore be modest. To understand this point, it is useful to remember how approaches on the role of economic policy evolved, along with the recommended policy interventions in each case. The normative approach, which predominated up until the 1980s, contended that markets and government were equally efficient. The role of government was to remedy market failures (in regulatory terms this meant preventing the exercise of monopoly market power), to produce public goods and to redistribute income. The implicit assump-

tion was that the government in question was perfect and would maximize welfare.

In this way, policy design turned into a problem of optimization, subject to technology constraints and feasible government action. This was the contribution of the theory of the “second-best,” exemplified in the work of Ramsey on pricing for services subject to economies of scale.¹⁰

When the informational limitations of policy designers became clear, regulation was posed as the solution to a problem of incentives between agents (the firms regulated) and a principal (the regulator). The impressive theoretical contribution of Baron and Myerson (1982)—the possibility of offering a monopolist a menu of payments calibrated to reveal its real cost—boosted confidence in discovering the social optimum restricted by information. The rules of the game would be freely defined by the principal and applied by agents who would behave strategically *just within the realm of such rules*. The pressures in other social dimensions that influence the outcome of the game are not mentioned. In other words, the context would be one of political vacuum. Hardly surprisingly, regulation did not turn into “incentive engineering” *because both the degree of application of rules and their change are part of the game*. The rules are determined in a larger social context with more players and unknown strategies for the mechanism designer.

In the previous section, we referred to the fallibility of policy designers, their involvement as interested parties, the intervention of contradictory interests in designing the rules, and the possibility that formal policy is either not applied or

¹⁰ It is illustrative to remember that Boiteaux, one of the main proponents of this school, was never able to introduce this proposal in *Electricité de France*, where he worked.

is interpreted in ways that run contrary to its original spirit. Dixit (1996) summarizes such considerations about the evolution of policy design paradigms, saying that the starting point was the supposition that the government is an omnipotent, omniscient and benevolent dictator. The work on the “second-best” scotched the hypothesis of omnipotence. The results on asymmetric information got rid of that of omniscience. Policy negotiation in real time shows there is no dictator, and casts doubt on the benevolence of those designing the mechanisms.¹¹

If the transaction cost of politics is worked out, a regulatory system is efficient if it passes the *remediableness* test posited by Williamson (1996), according to which “an outcome for which no feasible superior alternative can be described and implemented with net gains is presumed to be efficient.” This test is important in defining the type of initial regulatory arrangements for each country and how they evolve. Williamson illustrates this point with the principle of “inefficiency by design.” Political property rights are particularly insecure in democratic regimes in which the measures defined by one generation of rulers are reversed by the next (Moe, 1990). If what is proposed is a system of regulation that aims to eliminate all and every existing rents at a stroke, it will be vulnerable and easy to reverse. Despite the good intentions of policy designers, over time there has to be an inter-temporal trade-off between the rents acceptable to initiate the change and the continuity of the original measures. With no alternatives, this intentionally inefficient design passes the test of remediableness.

THE ROLE OF BELIEFS IN THE LIFE OF INSTITUTIONS

In his pioneering work, North (1990) defines institutions as rules of the game or constraints designed to intermediate human interactions. Although this definition has helped to appreciate the importance of institutions in economic life, it is

¹¹ Laffont (2000) suggests that the economists who pretend to be benevolent in recommending policies cannot be taken seriously by the rest of society, since such an affirmation contradicts their model in which all other agents act in a selfish manner.

insufficient for the design of institutional changes. Greif (1994) notes how, in North’s definition, the rules of the game represent a special type of constraint on behavior. Unlike North, he suggests that institutions are non-technological constraints on human interactions. Greif’s great contribution is to show that institutions are made up of two interrelated elements. First, institutions are at once *organizations* that appear for endogenous reasons, and *cultural beliefs*, that is, how individuals expect others to act in varying contingencies. Second, institutions — if they are lasting— operate in a sort of “equilibrium.”

One of the simplest institutions (in the sense that no organization is required) is the reputation built on repeated interactions. The reputation mechanism illustrates the existence of voluntary restrictions that make formal rules unnecessary, and raises the question as to why such rules emerge and when they are observed. The range of situations in which beliefs sustain social behavior patterns is very wide. We can cite two examples from Basu (2000): the possibility of having tyrannies without tyrants and the self-fulfilling prophecy that hoarders and speculators are obnoxious.

In his first example, Basu discusses a situation where a person is considered disloyal to the tyrant if either he does not cooperate or *if he maintains relations with someone who is disloyal*, where individuals believe that no one else would dare to be disloyal; and where there are negative net payments involved in being disloyal —(the cost of exclusion) even if disloyalty brings no direct punishment from the tyrant. The regime maintains itself by mutual suspicion among the population, there being no need for the tyrant. In his second example, Basu comments on the general sense of revulsion generated by hoarders and speculators. Why are they obnoxious, even though they increase social welfare? That they are obnoxious is a self-fulfilling belief. A possible explanation is that in a society where the predominant view is that speculators are obnoxious, only those who have great love for money are prepared to suffer the opprobrium of being perceived that way. These examples illustrate two characteristics of the dynamic of beliefs: (i)

a recursive mechanism of social transmission is required, and (ii) some costly signals can make a perception progressively more permanent.¹²

Would it be realistic to regulate without norms? In practice, any reform is inserted into a nexus of political power and requires articulation with the existing legal order. The decision of creating additional organisms to administer and enforce the new rules depends on the gains to be achieved applying resources (if they exist) to compiling, processing and disseminating information or enforcing contracts as the social network expands (Aoki, 2000).

Many combinations of rules and transactions seem to yield similar regulatory outcomes, *ex ante*. Basic game theory is unable to determine which institution will be observed in reality, since its application throws multiple equilibria. On the other hand, in practice, there are identical mechanisms that, if *transplanted* —to use the language employed by Buscaglia and Ratliff (2000)— to different societies, will develop along very different lines. The use of game theory with an evolutionary approach, in combination with empirical elements (contextual comparisons and historical information), may help us understand the emergence of institutions and their dynamics. We will return to this point when we discuss the choice between “big bang” and gradual approaches to reform.

Among the factors that drive institutional adjustment is the limited capacity of economic agents to process information and to infer all the rules of the game and their consequences. With hindsight,

¹² In the case of regulation, the population should perceive that the increased cost of a service is offset by tangible benefits (for example, freeing up fiscal resources and using them to provide social services). It should be anticipated that changing beliefs about the benefits of a regulatory reform could operate under *loss aversion* conditions documented in experimental studies on decision-making under uncertainty (the population may be risk-loving over regulatory losses and risk-averse over regulatory gains at the same time). This would explain, in part, the unfavorable perceptions of reform documented in opinion surveys like those of *Latinobarómetro*, even in situations where there are positive gains.

we can see that this is what happened with the restructuring of the gas and electricity market in the United Kingdom. The radical change in market architecture and governance there (from a bid-based pool with centralized dispatch to a market of bilateral and voluntary contracts, along with the merger of the regulatory bodies of electricity and gas, OFFER and OFGAS, to form Ofgem) is an attempt to manage the unintended or unforeseen consequences of the original design; namely, the persistence of market power exercise in generation and the weakness of OFFER.

Aoki (2001) argues that the participants provide an incomplete, simplified and inexact representation of the interactions in any social domain (called *subjective game model*). When the actions of the players, based on their subjective model become consistent after a series of interactions, the reality observed —(jointly created by those actions) becomes stable and can be reproduced. An institution appears as the common part of the subjective model for (almost) all players. *An institution is, then, a shared belief about the structure of the game.*

How do we reach such a consistent position? While the actions derived from the subjective models yield results worse than those expected by the participants, the conflict of perceptions will continue, driving the search for new subjective game models until, eventually, an equilibrium is reached. For example, in the Colombian wholesale market, the hydroelectric generators experimented until they reached a common strategy: selling most of their firm’s energy through long-term contracts and bidding into the pool lower than the strike value of such contracts. So they generated their contracted energy or purchased at very low prices whenever they were in short position. Additionally, the low spot prices kept their fuel-fired competitors out of dispatch. Without doubt, such behavior is not the most profitable in times of drought. But it is an institutional equilibrium because it solved a very problematic coordination problem.

Like Greif, Aoki does not identify an institution as an organization (a public authority, the regulator or different collective actors) or as con-

straints on behavior (rules, norms or social codes). What is distinctive about Aoki's proposal is the reduction in the complexity on the part of those agents who are unwilling or unable to infer the rules and payments of a game in detail; information becomes compressed and viewed synthetically. *The structure of the game is a function of those shared beliefs about the results of repeated actions and interactions.* Those beliefs can vary from one place to another or through time, even when the organizations or the formal restrictive elements are the same. Differing beliefs give rise to differing institutional game structures.

THE DYNAMICS OF REFORM

An important decision in any reform is the order and speed of the measures that are introduced. Shock therapy ("big bang") involves all the required changes taking place at the same time, while a gradual approach involves the measures being taken separately and over time. The studies on reform dynamics mostly focus on macroeconomic reform and trade liberalization (Tommasi and Velasco, 1996), and implicitly presuppose the existence of rational agents, a system of law that applies infallibly, and institutions that appear exogenously at the beginning of the game and remain invariable throughout it. Effort is concentrated in understanding the way in which agents adjust their behavior when faced with an external change within the framework of conventional game theory. These studies provide information on matters such as the relation between the identity of the reformers and the sequence of the measures, or the relation between the impossibility of commitment and shock therapy, for instance.¹³

¹³ Tommasi and Velasco (1996) argue that a radical reform has better chances of success if it is driven by a leader with the background of a moderate or even one of opposition to the philosophy of reform. In this case, the consistent strategy would be first to introduce those reforms that most damage his electoral base. Rodrik (1989) suggests that a reformer with low credibility should exceed himself in his zeal to drive forward a reform that is wider ranging than that necessary to build a reputation ("conversion" syndrome). This idea is taken further by Martinelli and Tommasi (1997), who suggest that when governments cannot pre-commit and there are groups with veto powers, only the most radical reforms are likely to succeed. Because

There are refined political economy models of reform that endogenize the sequence of measures according to their complementarity over time or the possibility of organizing support coalitions to help each stage. In Dewatripont and Roland (1995), the gradual approach is preferable where there is uncertainty about the results of reform, about the costs of getting it wrong (higher in the case of "big bang"), and where the suggested measures reinforce themselves at each step. Wei's model (1997) relates the sequencing of measures with the conditions that support them at each stage. Wei also shows that, in some circumstances, it is politically impossible to implement a "big bang" reform, but possible to carry out the entire reform package with a strategy of "divide and rule" over time.¹⁴

Although such models involve multiple stages, they do not examine the possibility of changing beliefs and of increasing management capacities in order to accelerate the transition from one regulatory regime to another. The challenge of designing and supporting reforms is to implement feasible reforms that pass Williamson's remediableness test thus allowing for the possibility of them being deepened; and craft transition strategies toward superior equilibria.¹⁵ The non-institutional models just discussed are helpful in eliminating unfeasible alternatives to reform (even where agents are perfectly rational and where there is perfect rule enforcement) and in introducing the discipline of detailed political coalition analysis at each stage of reform.

History plays its part in defining the structure of the regulatory game, because agents have *bounded rationality* and form beliefs partly by trial and error, but particularly by examining the lessons of past experience (Kreps, 1990). The evolution of institutions is "path-dependent." Every path involves the selection, among many, of an institutional choice to solve a given prob-

of the high risk of reversal, such strategies require a great deal of evaluation in context before they are applied.

¹⁴ In the best style of Sun Tzu's *The Art of War*.

¹⁵ By superiority we mean the reduction of the costs of *direct* intervention of those interested to defend their interests, possibly by means of delegation to specialized organizations.

lem. Along this path, a group of institutions appear in other domains of social and economic interaction that co-evolve and mutually reinforce each other.

Bounded rationality implies that reaching an equilibrium between beliefs and rules may take time. This eventually happens when agents' strategies are resistant to *invasions* or, in other words, the strategies are *evolutionary stable*.¹⁶ With regard to the issue of institutional complementarity, path-dependence generates in turn interlocking between institutions operating in different domains. Institutional complementarity has two faces. On the one hand, it is not easy to assemble a radical reform in stages if each partial change requires capacities in other institutions that do not exist, or even worse if each partial reform contradicts the overall prevailing institutional philosophy. This is especially risky when instruments are transplanted from different legal systems. On the other hand, paradoxically, complementarity may assist the transition to a high-quality regulatory regime by means of a percolation process, which is discussed in the following paragraphs.

The basic result on the dynamics of interrelated institutions is called *the momentum theorem* (Milgrom, Qian and Roberts, 1991) whose content is illustrated as follows. In country X there exist only two political economy domains: the provision of public services and the courts. The first domain may be observed in two states: financially feasible vs. unfeasible tariffs. The second domain

may exhibit either high or low law enforcement. It turns out that country X lives in the worst possible world: public utility tariffs are unfeasible and the law is poorly enforced. The two social groups with the highest stakes at tariffs and enforcement are employees and backward industries, respectively. Employees prefer subsidized tariffs and backward industries extract rents from weak enforcement via, for example, high transaction costs for potential industry entrants. Both groups forecast their gains taking into account the effect of institutional performance.

The application of the momentum theorem to country X says that a transition to higher enforcement could induce financially feasible public utility tariffs. *For this to happen it is necessary that employees perceive net gains from the externalities created by the change in enforcement.* Higher law enforcement may lead to better public utility management and possibly to higher tariffs, which are surely perceived as an increased cost for employees. On the other hand, enforcement could generate benefits that compensate such costs in excess (for example, by entry of new industries providing more employment opportunities). Another possibility is that a sustained accumulation of best practices in enforcement may become impossible to ignore in the domain of public utilities, inducing the belief that things can change for the better. The reader who suspects that there may be an institutional "free lunch" should reflect on the cost of building capabilities and shaping beliefs, the motor of the transitions we have mentioned.

¹⁶ Evolutionary game theory does not presuppose perfect rationality on the part of agents, and has been incorporated as a tool of institutional analysis by Aoki. Chapters 7 and 11 of Gintis (2000) introduce this theory briefly.

A Framework for the Support of Reforms

There are some empirical lessons and applications of the principles discussed that should be considered before proposing reforms or a package to support reforms.¹⁷

1. The introduction of a reform sets in motion (or better, is the continuation of) a process that includes not only the definition of rules, but also their application and change. A reform is an inherently political process. The reformer runs a great risk if his (her) efforts are focused only on defining the regulatory technology. Support actions should include not just the regulator but also complementary institutions like the courts and antitrust bodies, as well as key actors in the balance of forces.
2. Credibility is the only asset of a regulator. Credibility cannot be built if rules are not enforced or the regulator loses the conceptual and legal disputes he (she) goes for. The regulator should not carry the burden of supervisory tasks beyond his (her) capacity.
3. The inefficiency introduced by the political process is related to the credibility of compromises. The design challenge is to suggest solutions in contexts and on issues where political compromise is not feasible either because the regulator lacks the interest or political capital to lead the change, or because there is a lack of trained personnel to administer and enforce a system of high-powered incentives, or because popular support for reform is low. There is no such thing as independent regulators in public services, as regulation is just another venue for policy making.
4. It is crucial to understand the origin and forces nurturing cultural beliefs if we are to evaluate whether the introduction of a reform is consistent with the technological constraints

(market structure), the traditions of redistributive politics, and the availability of human and organizational resources required to sustain it. In cases of extreme institutional weakness and small markets with very few players, it may be better to proceed stepwise to avoid opening a Pandora's box.

5. It is prudent to use simple instruments (for example, limits on vertical integration or horizontal concentration) instead of theoretically more efficient rules when high-powered incentive mechanisms can be manipulated and the regulator is weak. It is to keep in mind the high costs of collecting and processing the information necessary to identify behavioral changes. Complexity tends to yield erratic results in courts that either do not share the regulatory philosophy or are just inept. It is also prudent to reduce the number of disputes decided upon a logic that is hostile to the reform process.
6. Shock measures can be effective on structure (as was the case with atomized property in the Argentine generation industry, where there were observable changes in conduct), but less certainly so on architecture (mechanisms of price formation). This might be because of the lack of human resources to carry out regulation, cultural and commercial traditions, weak institutions and, above all, the legacy of redistributive policy.
7. It is now clear the harm done by reforms that started with a competitive market with two or three generators and without constraints to vertical re-integration. The temptation to allow vertical integration should be resisted, at least where it is not absolutely necessary owing to the small financial scale of operations, high risk of *hold up*, or restrictions over the number of potential investors in the country concerned.

¹⁷ These lessons are especially critical for reforms in small electricity markets. See Millán and Vives, 2001.

8. An institution established for a specific purpose can gradually take on a life of its own, changing its mission in practical terms. Detailed regulation (which is never complete because it ends in casuistry) discourages investment since it destabilizes the rules of remuneration. Property rights end up being threatened by the very entity whose job it is to build credibility in a new order. Once a regulator has decided to carry out its functions in a “heavy-handed” style, it is difficult to go back to a “light-handed” one: regulators will usually accept changes that improve the *status quo* but will resist those that undermine the tactical advantages achieved by this sort of style.
9. The introduction of a regulatory scheme that takes advantage of a crisis or other window of opportunity may serve as the focal point from which to begin a transition toward a new institutional equilibrium. Taking advantage of such situations can give rise to two types of error:
 - *Euphoria, arising from a confusion of the reform with the changes in organization and norms.* It can be misleadingly simple to introduce a specialized regulatory system whose effect hinges on conceptual consistency between, for instance, the regulator, the courts and anti-trust agencies. Where such consistency and mutual support is weak, the system will collapse or will have functional problems. A case that merits careful review is the electricity sector reform in El Salvador, where a generation architecture inspired by the Scandinavian *Nord Pool* was introduced, but with a small number of firms, without any prohibition against vertical integration and without any judicial traditions of anti-trust. Formal modifications can lead to a reform, but do not constitute institutions themselves. The ease with which changes are brought in can be attributable to a range of factors, such as, for instance, the creation of new interests that are able skillfully to foster and shape the process, or the failure of anti-reform interests to coordinate their opposition in the short

term. Where the latter is the case and the reform constitutes a provocation to which they are unable to respond, the long-term damage caused by reversion may be very high. Finally, a reform can be accepted in a syncretic way (just as was the case with the afro descendants who accepted the Catholic calendar of saints in praying to their original deities). In such circumstances, the new regime is only a disguised version of the old order, constituted for the sake of appearances.

- *Pessimism, when the conditions for carrying on an important change are overstated.* Usually the opportunities that arise are insufficient to introduce a major change in one go, or where they appear but there is no urgent demand from those likely to benefit (who may be enjoying high subsidies, for example). When the reformer lacks an entrepreneurial spirit and takes no risks, it becomes a question of waiting on events, whether positive systematic shocks or the collapse of the existing system. The budding reformer has to ask him(her)self, then, whether or not he(she) has an overly ambitious regulatory model in mind; or whether or not the reform is his(her) political priority.

Nothing that we have discussed or proposed would have much sense if there was no potential to move toward a superior equilibrium in circumstances where sector reform seems to lack positive convictions or where the institutional context is weak. The reformer has to solve a two-stage dynamic program. It seems that the first stage shall always consist of building on the political capital of the reformer so as to reach a new workable order. The path toward a new equilibrium would then branch in two different directions, depending on the outcome of the first stage.

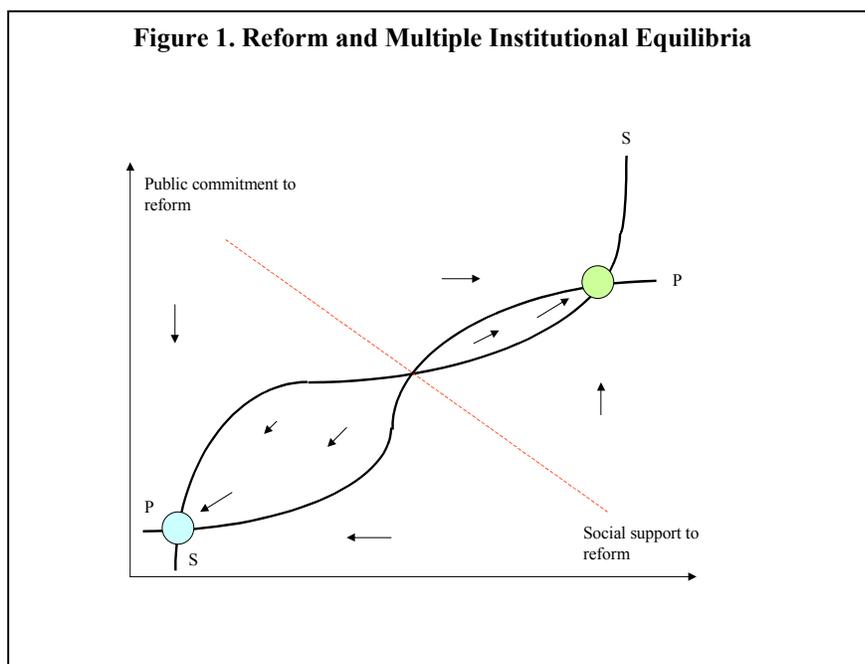
Where the reform produces exemplary results that encourage the mobilization of interests. In this case, institutional strengthening might prove self-financing since the political capital invested by the reformer would transform itself into a

political willingness to defend the achievements (second stage). If the new system of checks and balances resists attempts by entrenched interests from the previous regime to reverse it, one could then pass (third stage) to a greater use of specialized organizations and formal rules. This path of action would free up social resources devoted to the “self-defense” of property rights. Delegated bodies would defend customary rights once the organizational capabilities developed. The limiting factors in this trajectory are the ability to channel the mobilization of positive interests and the formation of the human capital required to administer and enforce the rules.

Where sectoral reform produces insufficient benefits to change beliefs. The sustained strengthening of capabilities in institutions that complement electricity regulation (the justice system, contract, anti-trust bodies, regulation of other services in networks) can create precedents that percolate through the practice of electricity regulation (second stage). This indirect route to-

ward regulation by *momentum* would appear when qualified manpower is in short supply and electricity is not a key factor in economic policy (or its political economy is very sensitive). The transition to high-quality organizations (third stage) will arise once there is manpower capable of administering the regulatory processes involved. The limiting factors on this second trajectory are the speed at which the rest of the institutions can be strengthened and sufficient manpower trained. Multisector regulation may speed up the formation of human capital, as well as reducing the risk of regulatory capture.¹⁸

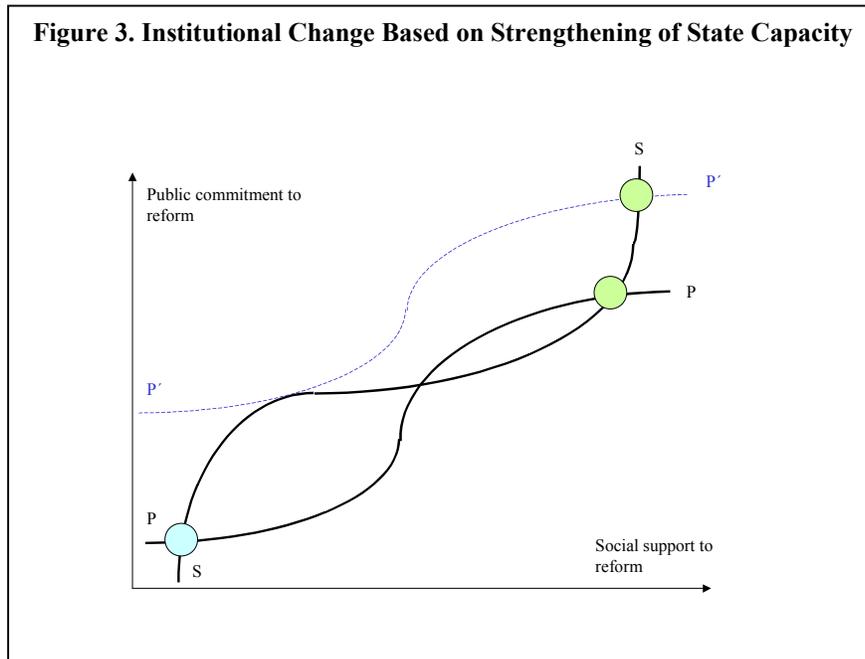
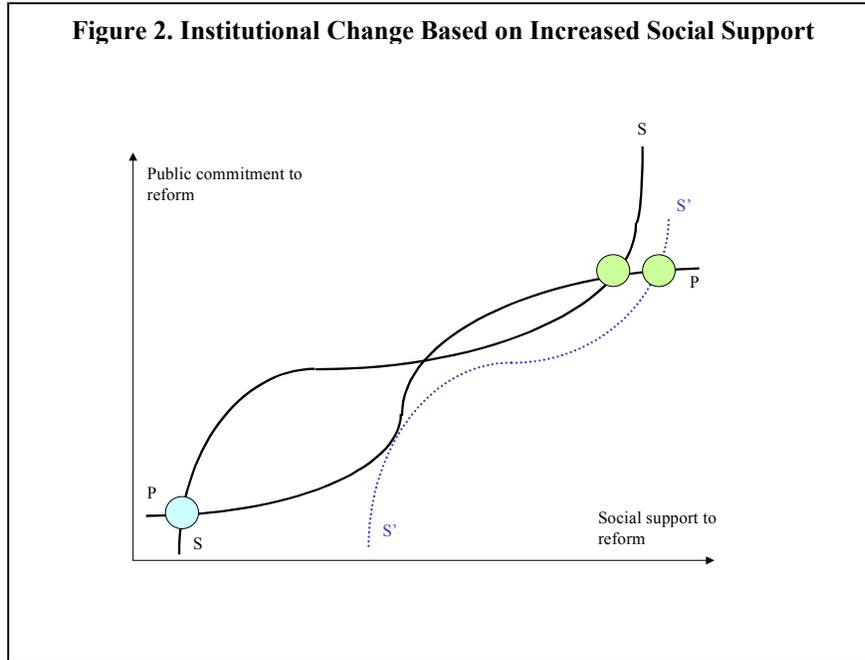
The dynamics described so far may be shown *à la* Krugman (1996). Figure 1 shows the response of government (public commitment) for every level of social support to the reform (curve P-P) and the response of society to every level of public commitment to the reform (curve S-S). Each curve is S shaped. The two possible equilibria (inferior and superior) are labeled with circles.



¹⁸ On this, it is worth reading the article by Aubert and Laffont, 2001.

A reform starting at the inferior equilibrium with insufficient public or social support will not take off, as indicated by the arrows in the diagram. According to the discussion above, two positive things could happen: increased social support (figure 2) and strengthening of state capacity (figure 3).

In each pure case the response curves shift (toward $S'-S'$ and $P'-P'$, respectively) until the inferior equilibrium disappears. Despite the extreme simplification, these diagrams are useful to analyse the approximate dynamic of reforms as a function of the status quo, the proposed measures and the reaction of participants.



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